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National Priority Chemicals Trends Report (2000-2004)

Section 4
Chemical Specific Trends Analyses for Priority Chemicals (2000−2004): Polychlorinated Biphenyls (PCBs)

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Polychlorinated Biphenyls (PCBs)

Chemical Information:

PCBs are mixtures of chemicals that form clear to yellow, oily liquids or white, crystalline (sand−like) solids and hard resins.

CAS Number – 1336−36−3

Alternate Names – Aroclor 1242, Aroclor 1254

General Uses – PCBs are used in insulating fluids of electrical systems. PCBs can also be a byproduct of certain process chemical reactions.

Potential Hazards – PCBs are probable carcinogens. These chemicals can affect the human reproductive system, can cause liver damage, and also can damage the nervous system. PCBs can irritate the eyes and may cause an acne−like rash (chloracne), which may persist for years. (New Jersey Department of Health and Senior Services, Hazardous Substance Fact Sheet −April 2002).

Summary Analysis:

- In 2004, 36 facilities reported approximately 68,000 pounds of PCBs. Compared to the national quantity reported in 2000, there was a decrease of approximately 42,000 pounds in 2004. In 2004, however, there was an increase of approximately 13,000 pounds or 25 percent, compared to the quantity of PCBs reported in 2003.
- REGIONAL: Compared to the quantities of PCBs reported in 2000, the quantity decreased in every EPA region by 2004. In 2004, facilities in EPA Regions 4 and 6 reported approximately 98 percent of the total quantity of PCBs.
- STATES: From 2000 to 2004, facilities in 34 states reported PCBs; by 2004, facilities in only 16 states reported this chemical. Facilities in only three of these states (Tennessee, Louisiana, and Texas) accounted for 98 percent of the total quantity of PCBs in 2004.
- FACILITIES: In 2004, one facility reported 61 percent of the total quantity of PCBs. Of the 36 facilities that reported PCBs in 2004, six facilities reported approximately 96 percent of the total quantity. In 2004, the number of facilities that reported PCBs decreased by 40 percent, compared to the quantities in 2000.
- MANAGEMENT: In 2000−2004, treatment was the primary method used to manage PCBs, including 94.5 percent of the total quantity in 2004.
- INDUSTRY SECTOR: Since 2000, facilities in 47 industry sectors reported PCBs. By 2004, facilities in only 17 industry sectors reported PCBs. In 2004, three industry sectors: SIC 2869 − Industrial organic chemicals, nec, SIC 2812 −Alkalies and chlorine, and SIC 3312 − Blast furnaces and steel mills reported 98 percent of this chemical.

National Trends:

Exhibit 4.191 shows the number of facilities that reported PCBs in 2000 to 2004 and the quantities that were managed via disposal, treatment, energy recovery, and recycling. In 2004, 36 facilities reported approximately 68,000 pounds of PCBs. Compared to the quantity reported in 2000, there was a decrease of approximately 42,000 pounds, or 38 percent, in 2004. Since 2000, the number of facilities reporting PCBs also decreased by 40 percent. In 2004, however, there was an increase of approximately 13,000 pounds, or 25 percent, compared to the quantity of PCBs reported in 2003.

From 2000 to 2004, treatment was the primary method used to manage PCBs, including 94.5 percent of the total quantity in 2004. Land disposal of PCBs has steadily decreased by approximately 74 percent; land disposal was used for 5.5 percent of the total quantity of PCBs in 2004. Only relatively small quantities of PCBs were managed using energy recovery. In 2004, facilities reported recycling of 366 pounds of PCBs.

Exhibit 4.191. National Management Methods for Polychlorinated Biphenyls, 2000−2004

Management Methods for PCBs and Number of Facilities	2000	2001	2002	2003	2004	Percent Change (2000−2004)	Management Method − Percent of Quantity of This PC (2004)
Number of Facilities	60	53	44	46	36	−40.0%	-
Disposal Quantity (pounds)	14,350	10,229	6,495	6,276	3,710	−74.1%	5.5%
Energy Recovery Quantity (pounds)	63	344	650	40	25	−60.7%	0.0%
Treatment Quantity (pounds)	95,060	45,092	97,661	48,110	64,023	−32.6%	94.5%
Priority Chemical Quantity (pounds)	109,472	55,665	104,806	54,426	67,758	−38.1%	-
Recycling Quantity (pounds)*	436	379	14	466	366	−16.1%	-

*Note: Waste minimization is the emphasis of this Report. As such, we primarily focus on quantities of PCs that are managed via onsite/offsite disposal, treatment, or energy recovery because we believe these PC quantities offer the greatest opportunities for waste minimization. Because recycled quantities of PCs are already directed to their best uses, they are considered separate and distinct from the quantities of PCs not recycled. Throughout this section, the recycled quantity is presented to provide some perspective regarding the quantity of this PC already recycled compared to the quantities that are managed via disposal, treatment, and energy recovery and thus potentially available for waste minimization.

Exhibit 4.192 shows the number of facilities that reported PCBs within various quantity ranges. In 2004, one facility reported 61 percent of the total quantity of PCBs. Of the 36 facilities that reported PCBs in 2004, six facilities reported approximately 96 percent of the total quantity.

Exhibit 4.192. Distribution of Quantities by Facilities Reporting Polychlorinated Biphenyls, 2004

PCBs (67,758 pounds)		
Quantity Reported	Number of Facilities Reporting This Quantity (2004)	Percent of Total Quantity of This PC (2004)
up to 10 pounds	5	less than 0.1%
11 − 100 pounds	16	1.0%
101 − 1,000 pounds	9	3.0%
1,001 − 10,000 pounds	5	35.1%
10,001 − 100,000 pounds	1	60.9%
100,001 − 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%

EPA Regional Trends:

Exhibits 4.193 and 4.194 show the quantity of PCBs reported by facilities in nine EPA regions in 2000 to 2004. Compared to the quantities of PCBs reported in 2000, the quantity decreased in every EPA region by 2004. Facilities in EPA Regions 5 and 9 reported the largest decreases of 16,400 pounds and 11,500 pounds, respectively.

In 2004, facilities in EPA Regions 4 and 6 reported approximately 98 percent of the total quantity of PCBs. Facilities in six of the eight EPA regions reported a decreased quantity of PCBs in 2004, compared to the quantities reported in 2003. Facilities in Regions 4 and 6 reported overall increases of approximately 15,000 pounds and 7,000 pounds, respectively.

Exhibit 4.193. Regional Quantities of Polychlorinated Biphenyls, 2000–2004

EPA Region	2000 (pounds)	2001 (pounds)	2002 (pounds)	2003 (pounds)	2004 (pounds)	Percent Change in Quantity (2000–2004)	Percent of Total Quantity of This PC (2004)
1	6,015	15	5	117	61	–99.0%	0.1%
2	1,278	6,119	119	464	155	–87.9%	0.2%
3	2,088	1,146	12,140	799	376	–82.0%	0.6%
4	45,277	21,069	32,272	28,608	43,327	–4.3%	63.9%
5	16,749	1,542	3,365	2,285	295	–98.2%	0.4%
6	25,495	16,099	17,905	16,045	22,962	–9.9%	33.9%
7	431	73	87	151	25	–94.2%	0.0%
9	12,098	6,174	38,856	5,957	558	–95.4%	0.8%
10	42	3,427	57	0	0	–100.0%	0.0%
Total	**109,472**	**55,665**	**104,806**	**54,426**	**67,758**	**–38.1%**	**100.0%**

Exhibit 4.194. Distribution of Facilities Reporting Polychlorinated Biphenyls, in 2004 and the Quantities of Polychlorinated Biphenyls Reported in 2004, by EPA Region

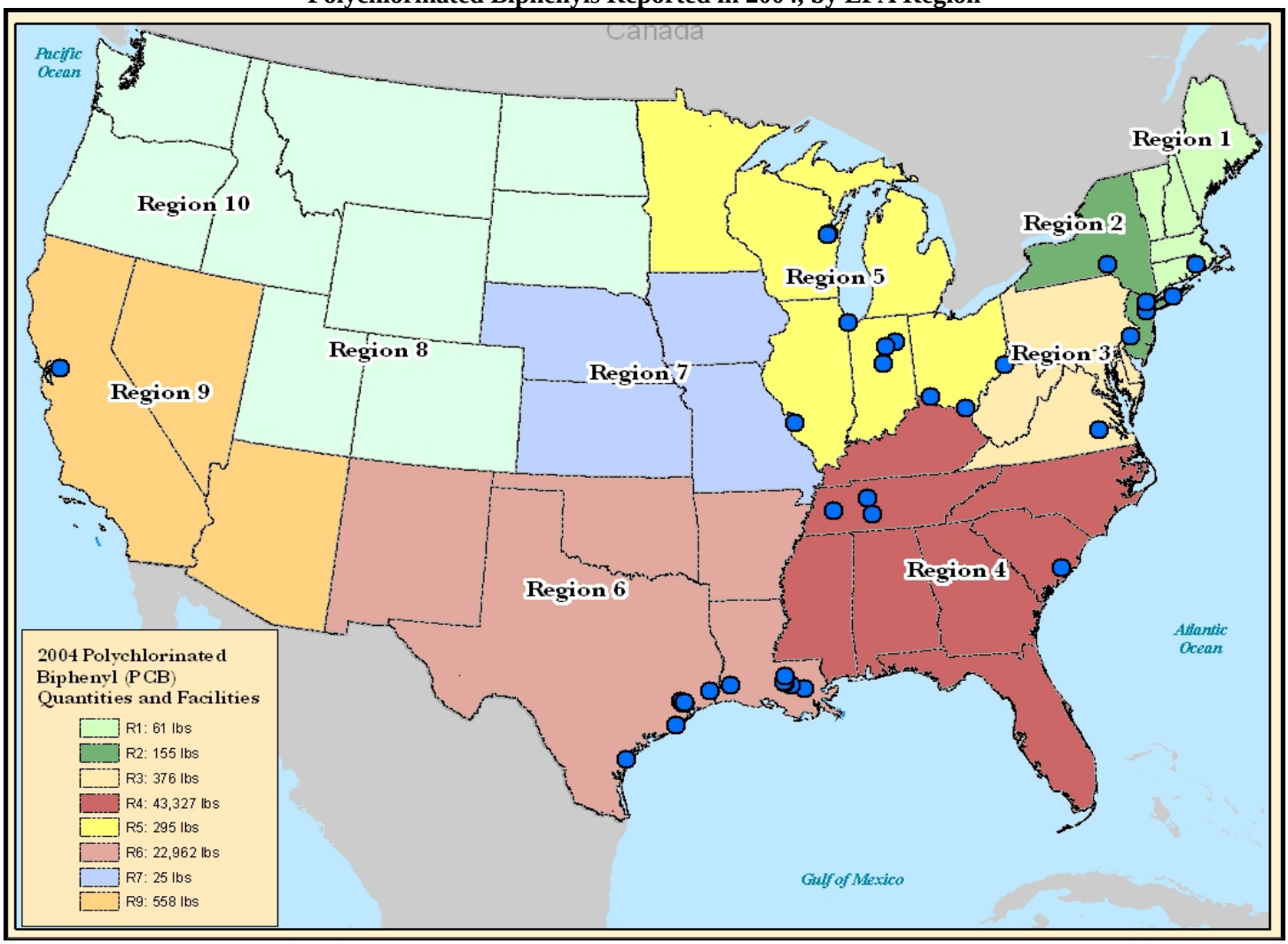


Exhibit 4.195 shows how facilities managed PCBs, by EPA region, in 2004. In 2004, facilities in six of the eight EPA regions treated most of the PCBs. Facilities in EPA Regions 2 and 5 primarily used offsite land disposal. One facility in Region 6 reported approximately 95 percent of the recycled quantity of PCBs in 2004.

Exhibit 4.195. Regional Management Methods for Polychlorinated Biphenyls, 2004

EPA Region	Quantity of PCBs (2004)	Percent of Total Quantity of PCBs (2004)	Disposal (pounds)		Energy Recovery (pounds)		Treatment (pounds)		Recycling (pounds)	
			Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
1	61	0.1%	0	1	0	0	0	60	0	0
2	155	0.2%	0	132	0	11	0	12	0	18
3	376	0.6%	0	0	0	0	0	376	0	0
4	43,327	63.9%	1,922	44	0	0	0	41,361	0	0
5	295	0.4%	3	171	14	0	2	105	0	1
6	22,962	33.9%	0	1,438	0	0	21,070	453	347	0
7	25	0.0%	0	0	0	0	0	25	0	0
9	558	0.8%	0	0	0	0	0	558	0	0
Total	**67,758**	**100.0%**	**1,925**	**1,786**	**14**	**11**	**21,072**	**42,951**	**347**	**19**

State Trends:

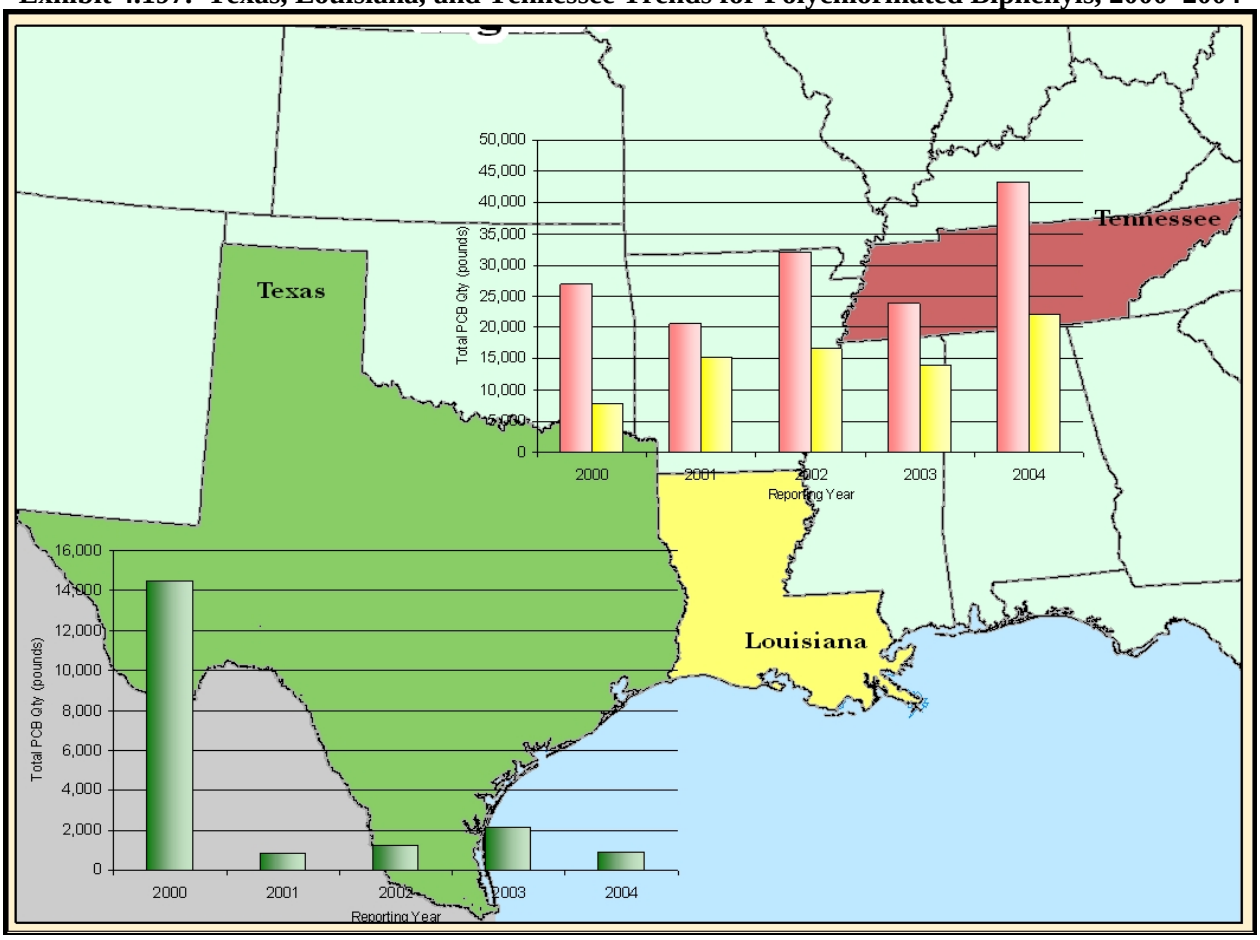
From 2000 to 2004, facilities in 34 states reported PCBs; by 2004, facilities in only 16 states reported this chemical. Facilities in only three of these states (Tennessee, Louisiana, and Texas) accounted for 98 percent of the total quantity of PCBs in 2004 (Exhibits 4.196 and 4.197). Since 2000, the quantity of PCBs reported in both Tennessee and Louisiana increased significantly; much of the increases were reported in 2004. Other trend highlights are:

- In Tennessee, one facility accounted for most of the increase in 2004; PCBs are produced as a residual from a high temperature catalytic process and the quantity correlates to production quantity.
- In Louisiana, two facilities accounted for most of the increase reported in 2004; the PCBs are generated as residuals from the manufacturing processes and the quantity fluctuates depending on feedstock composition.
- Since 2000, facilities in Texas reported a decrease of approximately 13,600 pounds or 94 percent.

Exhibit 4.196. State Quantity Trends for Polychlorinated Biphenyls, (Facilities Reporting 98 percent of Quantity Total), 2004

State	Total Quantity (pounds) of PCBs					Change in Quantity (2000−2004)	Percent Change in Quantity (2000−2004)	Percent of Total Quantity of This PC (2004)
	2000	2001	2002	2003	2004			
TN	26,905	20,583	32,096	23,901	43,225	16,320	60.7%	63.8%
LA	7,811	15,203	16,620	13,881	22,059	14,248	182.4%	32.6%
TX	14,492	881	1,251	2,164	903	−13,589	−93.8%	1.3%
Total	**49,208**	**36,668**	**49,967**	**39,946**	**66,187**	**16,979**	**34.5%**	**97.7%**

Exhibit 4.197. Texas, Louisiana, and Tennessee Trends for Polychlorinated Biphenyls, 2000–2004

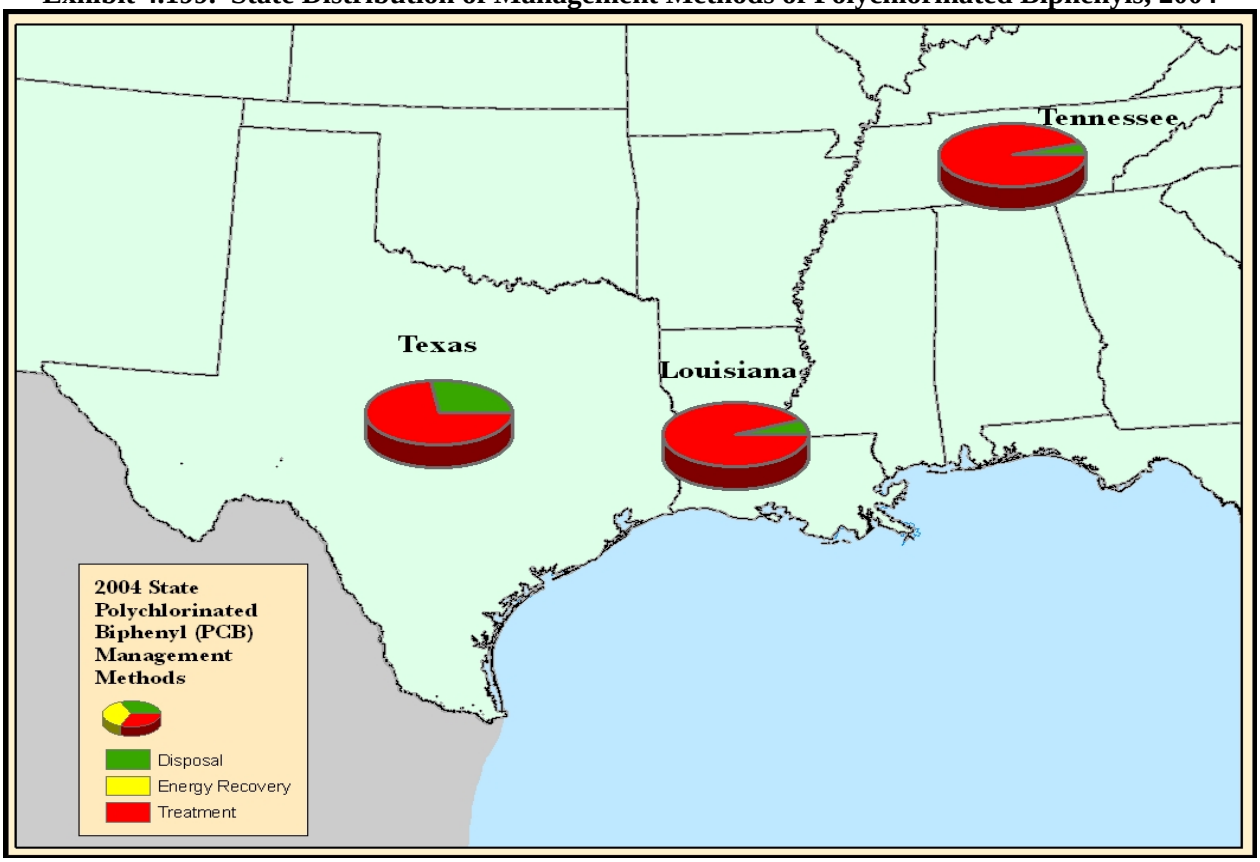


Exhibits 4.198 and 4.199 show how facilities in these three states managed PCBs in 2004. These facilities treated approximately 95 percent of the PCBs and land disposed approximately 3,400 pounds. A facility in Texas reported recycling 347 pounds of PCBs in 2004.

Exhibit 4.198. State Management Methods for Polychlorinated Biphenyls, (Facilities Reporting 95 Percent of the Total Quantity), 2004

State	Total Quantity of PCBs (2004)	Onsite Disposal (pounds)	Offsite Disposal (pounds)	Onsite Energy Recovery (pounds)	Offsite Energy Recovery (pounds)	Onsite Treatment (pounds)	Offsite Treatment (pounds)	Onsite Recycling (pounds)	Offsite Recycling (pounds)
TN	43,225	1,922	40	0	0	0	41,263	0	0
LA	22,059	0	1,191	0	0	20,681	187	0	0
TX	903	0	248	0	0	389	266	347	0
Total	**66,187**	**1,922**	**1,478**	**0**	**0**	**21,070**	**41,716**	**347**	**0**

Exhibit 4.199. State Distribution of Management Methods of Polychlorinated Biphenyls, 2004



Industry Sector (SIC) Trends:

Since 2000, facilities in 47 industry sectors reported PCBs. By 2004, facilities in only 17 industry sectors reported PCBs. Exhibit 4.200 shows the quantity of PCBs for the three industry sectors in which facilities reported 98 percent of this chemical in 2004. Facilities in SIC 2869 (Industrial organic chemicals, nec) reported the highest quantities, accounting for approximately 74 percent of the total quantity of PCBs in 2004. Since 2000, SIC 2869 facilities reported a steadily increasing quantity of PCBs, including an increase of approximately 22,000 pounds in 2004, compared to the quantity reported in 2003. Most of this increase was reported by one facility that attributed the increased quantity of PCBs to increased production in which PCBs are produced as a residual from a high temperature catalytic process.

Since 2000, facilities in SIC 2812 (Alkalies and chlorine) had reported a steadily decreasing quantity of PCBs until 2004 when the quantity increased by approximately 5,000 pounds. Most of this increase was reported by two facilities at which PCBs are generated as residuals from the manufacturing processes; the quantity of PCBs fluctuates depending on feedstock composition and production level.

Facilities in SIC 3312 (Blast furnaces and steel mills) reported a decrease of approximately 1,300 pounds in 2004. Much of this decrease was due to a facility in Minnesota that had reported an average of approximately 1,400 pounds in 2000−2003 but did not report PCBs in 2004.

Exhibit 4.200. Industry Sectors Containing Polychlorinated Biphenyls, (Facilities Reporting 98 Percent of the Total Quantity), 2004

Primary SIC	SIC Description	Number of Facilities That Reported PCBs (2004)	2000 (pounds)	2001 (pounds)	2002 (pounds)	2003 (pounds)	2004 (pounds)	Change in Quantity (2000−2004)	Percent of Total Quantity of This PC (2004)
2869	Industrial organic chemicals, nec	8	574	19,250	33,438	28,158	49,794	49,220	73.5%
2812	Alkalies and chlorine	3	21,604	15,262	13,173	8,214	13,266	−8,338	19.6%
3312	Blast furnaces and steel mills	3	4,443	3,495	4,773	5,497	3,121	−1,322	4.6%
Total		**14**	**26,621**	**38,007**	**51,384**	**41,869**	**66,181**	**39,560**	**97.7%**

Exhibit 4.201 shows how facilities in these industry sectors managed PCBs in 2004. Facilities in SIC 2869 (Industrial organic chemicals, nec) and SIC 2812 (Alkalies and chlorine) used treatment for most of the PCBs quantity; SIC 2869 facilities primarily used offsite treatment, SIC 2812 facilities used mostly onsite treatment. The entire quantity of PCBs reported by facilities in SIC 3312 (Blast furnaces and steel mills) was land disposed. One SIC 2869 facility reported recycling 347 pounds of PCBs in 2004.

Exhibit 4.201. Industry Sector Management Methods for Polychlorinated Biphenyls, (Facilities Reporting 98 Percent of the Total Quantity), 2004

Primary SIC	SIC Description	Total Quantity of PCBs (2004)	Percent of Total Quantity (2004)	Disposal (pounds)		Energy Recovery (pounds)		Treatment (pounds)		Recycling (pounds)	
				Onsite Disposal	Offsite Disposal	Onsite Energy Recovery	Offsite Energy Recovery	Onsite Treatment	Offsite Treatment	Onsite Recycling	Offsite Recycling
2869	Industrial organic chemicals, nec	49,794	73.5%	0	214	0	0	7,928	41,652	347	0
2812	Alkalies and chlorine	13,266	19.6%	0	3	0	0	13,084	179	0	0
3312	Blast furnaces and steel mills	3,121	4.6%	1,922	1,199	0	0	0	0	0	0
Total		**66,181**	**97.7%**	**1,922**	**1,415**	**0**	**0**	**21,012**	**41,831**	**347**	**0**